

WHAT IS CLAIMED IS:

1. A sheet feed device comprising:

a sheet accommodating unit for accommodating a plurality of cut sheets in a stacked condition;

5 a sheet feed roller that feeds a cut sheet accommodated in the sheet accommodating unit, the cut sheet having a leading edge and a trailing edge defined in relation to a sheet feed direction in which the cut sheet is fed by the sheet feed roller;

10 a trailing edge detector that detects the trailing edge of the cut sheet and outputs a detection signal indicative of the detection of the trailing edge; and

a control unit that determines a timing at which a subsequent cut sheet is fed out by the sheet feed roller
15 based on the detection signal.

2. The sheet feed device according to claim 1, wherein the trailing edge detector is disposed in a position upstream of the sheet feed roller with respect to the sheet feed direction.

20 3. The sheet feed device according to claim 1, wherein the sheet feed roller is disposed in a first position upstream of the leading edge of the cut sheet accommodated in the sheet accommodating unit and the trailing edge detector is disposed in a second position
25 further upstream of the sheet feed roller with respect to

the sheet feed direction.

4. The sheet feed device according to claim 1,
wherein the sheet feed roller has a rotational shaft to be
rotatable with the sheet feed roller, and the trailing edge
5 detector is coaxially attached to the rotational shaft.

5. The sheet feed device according to claim 1,
wherein the trailing edge detector comprises a conversion
mechanism that converts movement of the cut sheet into
rotations.

10 6. The sheet feed device according to claim 5,
wherein the sheet feed roller has a rotational shaft to be
rotatable with the sheet feed roller, and the trailing edge
detector is operatively coupled to the rotational shaft.

7. The sheet feed device according to claim 6,
15 wherein the trailing edge detector comprises a disk
coaxially attached to the rotational shaft, and a rotation
sensor that detects rotations of the disk.

8. The sheet feed device according to claim 1,
wherein the sheet feed roller is a sector roller having a
20 rotational shaft to be rotatable with the sector roller, and
wherein the trailing edge detector comprises a collar shaft,
a collar fixedly attached to the collar shaft to be
rotatable with the collar shaft, a disk coaxially attached
to the collar shaft, and a rotation sensor that detects
25 rotations of the disk, wherein the sector roller feeds the

cut sheet during a first phase of one rotation and does not feed the cut sheet during a second phase of one rotation, and the collar rotates during the second phase and does not rotate during the first phase, the detection signal being
5 generated when the rotation sensor no longer detects the rotations of the disk.

9. The sheet feed device according to claim 1, further comprising a motor operatively coupled to the sheet feed roller, the sheet feed roller being rotated by
10 rotational power of the motor when the motor is energized and being freely rotatable when the motor is deenergized, wherein the sheet feed roller has a circular cross-section and is rotated due to frictional contact with the cut sheet when the motor is deenergized, the detection signal being
15 generated when the sheet feed roller is no longer rotated by the frictional contact with the cut sheet.

10. The sheet feed device according to claim 1, wherein the sheet accommodating unit has a wall for supporting a stack of the plurality of cut sheets in a
20 slanted condition, and the sheet feed roller is movable toward and away from the wall and held in contact with a topmost cut sheet in the sheet accommodating unit.

11. The sheet feed device according to claim 10, further comprising a roller support that supports the sheet
25 feed roller, the roller support being movable toward and

away from the wall.

12. A sheet feed device comprising:

a sheet accommodating unit for accommodating a plurality of cut sheets in a stacked condition;

5 a first roller that feeds a cut sheet accommodated in the sheet accommodating unit, the cut sheet having a leading edge and a trailing edge defined in relation to a sheet feed direction in which the cut sheet is fed by the first roller;

10 a trailing edge detector that detects the trailing edge of the cut sheet and outputs a detection signal indicative of the detection of the trailing edge;

a second roller disposed downstream of the first roller with respect to the sheet feed direction, wherein the second roller starts conveying the cut sheet when the first roller stops feeding the cut sheet, and the trailing edge detector starts detecting the trailing edge of the cut sheet when the first roller stops feeding the cut sheet; and

15 a control unit that determines a timing at which a subsequent cut sheet is fed out by the first roller based on the detection signal.

13. The sheet feed device according to claim 12, wherein the trailing edge detector is disposed in a position upstream of the first roller with respect to the sheet feed direction.

25 14. The sheet feed device according to claim 12,

wherein the first roller is disposed in a first position upstream of the leading edge of the cut sheet accommodated in the sheet accommodating unit and the trailing edge detector is disposed in a second position further upstream of the first roller with respect to the sheet feed direction.

15 15. The sheet feed device according to claim 12, wherein the first roller has a rotational shaft to be rotatable with the first roller, and the trailing edge detector is coaxially attached to the rotational shaft.

10 16. The sheet feed device according to claim 12, wherein the trailing edge detector comprises a conversion mechanism that converts movement of the cut sheet into rotations.

15 17. The sheet feed device according to claim 16, wherein the first roller has a rotational shaft to be rotatable with the first roller, and the trailing edge detector is operatively coupled to the rotational shaft.

20 18. The sheet feed device according to claim 17, wherein the trailing edge detector comprises a disk coaxially attached to the rotational shaft, and a rotation sensor that detects rotations of the disk.

25 19. The sheet feed device according to claim 12, wherein the first roller is a sector roller having a rotational shaft to be rotatable with the sector roller, and wherein the trailing edge detector comprises a collar shaft,

a collar fixedly attached to the collar shaft to be rotatable with the collar shaft, a disk coaxially attached to the collar shaft, and a rotation sensor that detects rotations of the disk, wherein the sector roller feeds the cut sheet during a first phase of one rotation and does not feed the cut sheet during a second phase of one rotation, and the collar rotates during the second phase and does not rotate during the first phase, the detection signal being generated when the rotation sensor no longer detects the rotations of the disk.

20. The sheet feed device according to claim 12, further comprising a motor operatively coupled to the first roller, the first roller being rotated by rotational power of the motor when the motor is energized and being freely rotatable when the motor is deenergized, wherein the first roller has a circular cross-section and is rotated due to frictional contact with the cut sheet when the motor is deenergized, the detection signal being generated when the first roller is no longer rotated by the frictional contact with the cut sheet.

21. The sheet feed device according to claim 12, wherein the sheet accommodating unit has a wall for supporting a stack of the plurality of cut sheets in a slanted condition, and the first roller is movable toward and away from the wall and held in contact with a topmost

cut sheet in the sheet accommodating unit.

22. The sheet feed device according to claim 21,
further comprising a roller support that supports the first
roller, the roller support being movable toward and away
5 from the wall.